PLANS FOR THE PROPOSED ZOOLOGICAL PARK IN NEW YORK.

LAST spring the plans of the New York Zoological Society reached a point where it became necessary to take up the many questions involved in the design and construction of buildings and other enclosures for animals, and also their arrangement in the proposed Zoological Park. The Executive Committee realized the necessity of a thorough examination and study of the best zoological gardens of Europe.

Accordingly, Mr. William T. Hornaday, the Director, was instructed to visit all the large gardens of Europe, examine them carefully, and bring back photographs and designs of their most valuable and interesting features. He left New York in June, and visited the zoological gardens of the following cities, in the order named: London, Antwerp, Rotterdam, The Hague, Amsterdam, Hanover, Hamburg, Berlin, Dresden, Leipsic, Frankfort, Cologne and Paris. Altogether fifteen gardens were inspected, and their best features were photographed, sketched and studied throughout. Without an exception, the Directors, Superintendents and Inspectors of the gardens visited were very cordial. Every fact asked for was cheerfully furnished, without the slightest hesitation or reservation. Not only were good features pointed out as being worthy of special attention, but some officers very kindly indicated the mistakes that had been made in their gardens in the early days when everything had to be determined by experiment, thus showing what to avoid.

In London, Dr. P. L. Sclater, the executive head of the London Zoological Society, gave all the information and facilities for photographing that were desired in the Society's gardens, and Mr. Clarence Bartlett, Assistant Superintendent, explained the entire working machinery of this truly magnificent zoological institution.

At Antwerp the visitor is fairly amazed at the perfection of all the larger buildings for animals and the extreme beauty and attractiveness of nearly every feature of that scientific establishment. Director L'hoest and his Assistant, M. J. De Winter, were untiring in their willingness to afford all the information desired, and to show everything not open to general view. Only two and one-half hours distant is found the beautiful garden at Rotterdam, known to but few Americans, where Dr. Von Bemmelin pointed out with pardonable pride the newest lion house, in Europe, and the first great flying cage ever constructed for the larger wading birds. An equally short distance farther on, at Amsterdam, is found a very rich colleclection, installed amid charming surroundings, in which the health and 'condition' of every bird and quadruped seems absolutely perfect. In the absence of Director Kerbert, Inspector Castens devoted hours of time to answering the question, "How do you keep everything in such fine condition?"

At Hanover, Dr. Ernest Schäff fully explained the plan of foundation and management of his zoological *forest*, and supplied a plan of the new and admirably constructed Antelope House. At Berlin was found another royal establishment, with the larger mammalia housed in ornate and costly buildings. The garden occupies part of imperial grounds and it is one of which the citizens of Berlin may well be proud. Dr. Ludwig Heck, its director, became much interested in the New York plan, and his cooperation was heartily extended. At Hamburg another very fine garden was inspected, in which all the shade is the result of artificial planting. It thus affords a fine opportunity to observe what can be accomplished if sufficient time is allowed. The shade trees are now very beautiful, and at once impress the expert visitor as being remarkably well distributed to serve their purpose of shading

both the out-door animals and the walks. Two days were spent with Herr Carl Hagenbeck, who has at Hamburg a *Thierpark* of his own, quite as large as the Central Park Menagerie of New York. Probably no man living has given more study to the problems of zoological garden construction and the care of animals in captivity, and Mr. Hornaday found him not only willing but eager to explain the mistakes to avoid, as well as the latest developments in the care of animals.

The director of the very interesting garden at Cologne, Dr. Wunderlich, was quite as ready with helpful information as his colleagues of other cities, and some of the features of his establishment were found to possess exceptional interest. The Frankfort garden contains much that is new and admirable. Prof. Milne Edwards, Director of the Paris *Jardin des Plantes*, also extended every facility for study and examination of this the oldest garden of Europe. Regarding the status of a garden which, like this, is free to the entire public, the experiences and observations of Prof. Milne Edwards were both interesting and valuable. He expressed the opinion that no zoological garden should be kept open every day in the week, principally because it is not best for the collections.

The store of photographs, sketches, notes and plans collected during this tour are now being utilized in the preliminary plans for the New York Park. It is proposed to determine the location and general design of every building and enclosure before the project is finally submitted to the city authorities in January, 1897. The site selected by the Society is the southern portion of Bronx Park, about a quarter of a mile south of the Botanical Garden. According to the Charter granted to the Society by the New York Legislature in 1895, the approval of this selection rests with the Mayor and Commissioners of the Sinking Fund.

CURRENT NOTES ON PHYSIOGRAPHY.

GLACIAL SAND PLAINS ABOUT NARRAGANSETT BAY.

The geographical significance of glacial action is well exhibited in an account of the 'Retreat of the ice sheet in the Narragansett bay region,' by J. B. Woodworth (*Amer. Geol.*, XVIII., 1896, 150–168). Sand Plains, stretching east and west, repeatedly succeed one another on a north-south line. Each plain was formed rapidly by streams flowing out from the margin of the slowly retreating ice sheet into standing water; whether the standing water was an arm of the sea, then about fifty feet higher than now, or a local water body, is not determined. Each plain has the gently sloping surface, the lobate front and the peculiarly stratified structure of a delta; but at the head the plain falls off northward in a steep slope, associated with kames, and descending to a lowland area that is often boulder-strewn and marked by gravel mounds or occupied by swampy basins drained by sluggish streams; here the ice sheet stood while the plain was forming. This lowland is compared to the 'fosse,' a marked feature on Nantucket, between the head of the great sand plain on the south and the moranic till mounds on the north. The same might be said of the similar fosse on Martha's Vineyard.

A small but well defined boulder moraine in southwest Rhode Island is described by Woodworth and Marbut (Chicago Journ. Geol., IV., 1896, 691–703).

TOPOGRAPHIC TERMS OF SPANISH AMERICA.

The richness of some languages and the poverty of others in terms descriptive of topographic form has often been remarked. The New Englander never invented a generic name for the numerous drumlins that he early selected for clearing; they were to him simply 'hills.' The Spanish race is more appreciative and a num-